Business Plan 2016-2018

Independent Electricity System Operator

November 16, 2015

ieso
Independent Electricity System Operator

Contents

Introduction

With the merger of the Independent Electricity System Operator (IESO) and the Ontario Power Authority (OPA), the accountabilities of the new IESO extend across the Ontario electricity sector. The new organization will be challenged to support ongoing change in the sector – the scope, complexity and pace of change over the next 10 to 15 years is expected to exceed that experienced during the period when Ontario was eliminating coal from its supply mix. At the same time, within its expanded accountabilities, the IESO maintains responsibility for the reliable operation of the province's bulk electricity system in real time and, through its planning, conservation, market and procurement responsibilities, ensures reliability is maintained into the future.

The merger has driven savings including a workforce reduced by 35 employees, real estate savings and the elimination of one Board of Directors. These and other efficiencies have resulted in a decrease in annual costs of more than $5 million. The IESO's 2016-2018 business planning efforts build on these efficiencies and achieve annual savings of more than $10 million by 2018.

The merger synergies, along with additional savings, will be maintained throughout the three-year business planning period and will result in a nine-percent reduction in the usage fee charged to all consumers based on a revenue requirement of $182.1 million in 2016. Recognizing the pressures to manage cost impacts of its operations, the plan also proposes to maintain the lower 2016 fee through 2017 and 2018 – a significant challenge given the scope and complexity of the business.

Throughout 2015, the IESO has been focused on integrating the two organizations, merging information technology, financial and business systems and processes, and consolidating staff in new work units and locations. While a significant amount of merger-related work has been completed, a number of activities are still underway – one particularly important area being the mapping of employees into consistent job classifications.

Transition work will continue into 2016, including the establishment of an enhanced IESO website, which will become a key source of information and data for program and market participants, as well as for stakeholders and electricity consumers, addressing both real-time and future needs. This consolidated website will serve both large and small customers across the province, providing the information needed to better access programs, manage costs and guide the behaviours needed to promote a reliable and efficient electricity system.

The IESO's conservation responsibilities are also in transition. The IESO is now implementing the province's Conservation First Framework, which calls for seven terawatt-hours (TWh) of energy savings by the end of 2020, with funding of $2.2 billion to be administered by the IESO over the program's six-year term. The framework shifts more responsibility for delivery to the

local distribution companies (LDCs), which have been provided budgets from the IESO to meet their assigned conservation targets. The IESO has now signed Energy Conservation Agreements (ECAs) with every LDC and has reviewed and conditionally approved all but one of the associated Conservation and Demand Management (CDM) plans that outline how those targets will be achieved. Under these arrangements, the IESO will be responsible for the administration of the framework and managing the ECAs, ensuring compliance with the plans, settlement of payments, and program and plan cost-effectiveness. Some LDCs are not expected to begin operating under the new framework until late 2015 or early 2016, and work to close out the 2011-14 conservation framework is overlapping with the start up of the new framework.

For the industrial sector, the IESO is responsible for the implementation and management of the $500-million Industrial Accelerator Program, targeting 1.7 TWh of savings over the same six-year time period as the Conservation First Framework.

The IESO faces continuing change in the electricity sector. Smart grids, new connections, monitoring, storage and automation tools are both driving change and increasing the complexity of operations, while enabling consumers at all levels to take greater control of their energy requirements. These developments, including Ontario's investment in renewable energy, embedded generation and conservation, are in turn requiring the IESO to continuously re-examine and, where necessary, refocus its operating, planning and resource development functions and programs.

At the same time, demand for electricity continues to remain flat, reflecting the impact of conservation and the increase in embedded generation, along with general economic conditions.

Ontario's climate-change strategy and the proposed cap-and-trade market have the potential to place new, unanticipated demands on the IESO. Depending on the implementation choices, the role of the IESO and the impact on the sector could be substantial. The IESO will continue to monitor government initiatives, as these are a source of uncertainty in this plan.

Strategic Themes

The IESO has adopted three strategic themes that provide context for its business planning. These themes are:

- Providing Public Value
- Building Corporate Resilience
- Respecting and Valuing Our Stakeholders

The Providing Public Value theme establishes goals within the IESO mandate, identifying and creating public value such as efficient system and market operations and cost-effective conservation, as well as working with stakeholders and government to inform public discussion of issues and opportunities in the electricity sector.

The Building Corporate Resilience theme is about operational and administrative flexibility and adaptability – ensuring that the IESO has the employee resources and skills, technologies, and financial and organizational capabilities to achieve the public value outcomes on which it is focused.

The Respect and Value Our Stakeholders theme is about earning stakeholder and government support and building on the organization's commitment to its stakeholder engagement processes.

Maintaining reliability – both today and tomorrow – is a key public value for the IESO. Achieving that priority extends into functions across the entire IESO – planning for future conditions, procurement of necessary resources, strong working relationships across the sector and excellence in real-time operations are all critical to successfully meeting the IESO's reliability commitment.

Business Unit Functions

The following highlights the IESO's focus and deliverables over the business planning period.

Operations

The changing supply mix, the required integration of major initiatives from North American reliability authorities and the advancement of new technologies will require changes in tools, practices and methodologies for Operations staff – an ongoing need that the IESO will address through the continued investment in the Operations business unit framework.

The IESO's Operations function manages real-time operations, balancing the supply of and demand for electricity, directing the flow of electricity across the province's transmission lines,

connecting generators that produce power, transmitters that send it across the province, local utilities that deliver it to people's homes and businesses, and industrial companies that use it in large quantities.

The outlook for the reliability of Ontario's electricity system is expected to remain positive for the 2016-2018 period given the investments to date in transmission, generation resources and conservation initiatives. However, these investments have resulted in a control room and a support system that is very different than it was a decade ago. And the control room a decade from now will also be significantly different than that of today, given the continued transformation of the power system.

Similar to past initiatives, such as Online Limits and Renewable Integration, there is a need to evolve the working environment to sustain the expected level of performance while preparing to meet the challenges of tomorrow. To address this, a series of linked but separate initiatives, both process and tool enhancements, are being developed to address areas of concern. These initiatives will be implemented in the 2016-2018 business planning period.

The demographics of the workforce also need to be addressed. With approximately 15 percent of Operations staff eligible for retirement by the end of 2018, knowledge transfer through operational training and development as well as succession planning will be a heightened priority in the Operations area.

Planning

Planning is a core responsibility of the IESO. Over the course of the business planning period, the IESO will be working with the provincial government to develop the next long-term plan for Ontario's electricity sector. In addition to ensuring a reliable power system, this plan will need to strike an appropriate balance between cost and environmental impact and accommodate a range of possible futures.

Inclusive of stakeholder input, the IESO will provide an integrated overall picture of demand, conservation, supply and transmission for the province with a focus on immediate required actions. Special attention will be placed on emerging technologies and their potential to impact the electricity sector.

The IESO's responsibilities with respect to long-term planning will become formalized as a result of Bill 135, *the Energy Statute Amendment Act*. If passed, this legislation will replace the current Integrated Power System Planning framework and codify the Long-Term Energy Plan (LTEP) as the new planning document. As part of the new framework, the IESO will be

responsible for the development of a technical report that will kick-off the LTEP consultations, and for an implementation plan post-LTEP.

Consistent with government policy guidance and Ontario Energy Board oversight, regional planning has become a new priority for the IESO. The province has been divided into 21 electricity planning regions, and the IESO will work with LDCs, municipal representatives, stakeholders, First Nations, Métis and others to develop integrated regional resource plans for each region. The regional plans take a long-term perspective, examining possibilities to meet future local electricity needs through conservation, generation, transmission and innovative solutions. This process supports community growth and values and should result in plans that will align better with other local planning initiatives.

Market and Resource Development

With a healthy supply margin anticipated over the business planning period, the IESO continues to work to further enhance the use of market-based mechanisms to address rapidly changing electricity conditions and to procure needed resources in a transparent and competitive manner. Demand response pilots have been contracted and a demand response auction is set to be held at the end of 2015, mechanisms that will encourage further participation in the market from the demand side.

The IESO will also look to improve the real-time wholesale market through a variety of key initiatives focusing on the day-ahead market, the scheduling and commitment of generation units, and the pricing methodology (currently a two-schedule system).

While the IESO will explore ways to further develop the market, the IESO's Contract Management Group continues to manage more than 23,000 contracts that account for over 23,000 MW of generation. These include contracts for 20,300 microFIT (representing 180 MW) and 3,060 FIT (representing 4,500 MW) projects. The majority of those contracts are in operation with 1,500 (or 4,200 MW) under development. Renewable energy projects account for 48 percent of contracted capacity (25 percent wind, 11 percent hydro, 10 percent solar, 2 percent bio-energy), with natural gas at 39 percent and nuclear at 13 percent.

These contracts represent $36 billion of private investment into Ontario's electricity sector over the past decade – ongoing management of these contracts is the responsibility of the IESO.

Conservation

As noted above, the IESO has been directed by the Minister of Energy to implement a new Conservation First Framework focused on achieving 7 TWh of energy savings by the end of 2020 within a budget of $2.2 billion.

The IESO has signed Energy Conservation Agreements with all 70-plus LDCs in Ontario and has been reviewing and approving the LDC CDM plans resulting from those agreements, plans that detail how the specific LDC targets will be achieved over the six-year period. These reviews will be ongoing over the business planning period as the LDC plans evolve.

The IESO provides program design and delivery support for LDCs and is also responsible for the evaluation, measurement and verification of all conservation programs and activities to validate the achievement of the 7 TWh target. The IESO is also developing centralized information tools to support the fiduciary reporting responsibilities of both the LDCs and the IESO.

Innovation in the marketplace will be key to the success of the Conservation First Framework, with LDCs relying on the development of new programs to help achieve their conservation targets. The IESO is supporting this need through the administration and operation of both a $70 million LDC Innovation Fund and a $9.5 million annual Conservation Fund.

The IESO has also been tasked with achieving 1.7 TWh of energy savings from large industrial transmission-connected customers within a cost of $500 million.

Information Technology

A significant portion of the Information Technology's (IT) resources are dedicated to supporting the ongoing and daily needs of the IESO and its customers, including the 24x7 support to help maintain the reliable operation of the IESO-controlled grid and the IESO-administered markets.

While 2016 remains a year of transition for merger-related initiatives, IT support will also be required to both launch significant new business initiatives and to support those business initiatives already underway. This is in addition to providing support for the ongoing daily operation of the business. Although a significant number of merger-related projects will be completed in 2015, a number of them will continue into 2016, the most significant of which is the consolidation of the current multiple websites using different technologies into two websites (IESO and **save**ON**energy**). Another example relates to the selection of a single solution for planning and forecasting.

The year 2016 will also see the completion of the IESO's initiative to be compliant with the new North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) version 5 rules that come into effect on April 1, 2016.

In addition, 2016 will see the completion of some significant projects (e.g., upgrade of the Energy Management System and Market Information Management System, and the systems to

support demand response) and the continuation of other significant initiatives (e.g., Market Information System and the Conservation Demand Management Information System).

Corporate Services

In 2016, the IESO will begin to realize the benefits of system and process integration resulting from the transition to one set of financial systems (e.g., payroll, financial accounting and reporting, and procurement) occurring in 2015. Further system and process enhancements will be undertaken in 2016, including migration to a single set of financial planning and budgeting tools. In settlements, a strategy will be developed to reduce reliance on end-user computing tools, and tools will be upgraded to leverage the benefits of greater automation.

Pension changes are being implemented to drive affordability and sustainability. Initiatives aimed at maximizing the value of people management processes (e.g., implementation of a single Human Resource Information System and talent management system) will also be completed.

Emphasis will also be placed on the unification of the IESO's culture, with several foundational activities occurring in 2015. A cultural assessment has been completed for the organization, with a project to engage employees to contribute to identifying and embedding values and behavioural norms that support the IESO's vision, mission and business strategy.

Stakeholder Engagement

The IESO engaged stakeholders in the development of the 2016-2018 Business Plan primarily through consultations with the newly formed Stakeholder Advisory Committee (SAC). Stakeholder engagement is integral to the IESO's decision-making process, and the SAC has an important role to provide the IESO with input and feedback on proposed decisions or changes that affect all stakeholders. Committees established prior to the merger of the OPA and IESO also provided timely policy level advice to the IESO Board of Directors and executive on material matters relating to each organization's mandate.

Earlier this year, the IESO Board appointed a new SAC to continue to provide advice on behalf of both the overall electricity sector and their constituencies with respect to the mandate of the new IESO, as outlined in the Committee's new Terms of Reference:

- The existing IESO-administered markets and the future evolution of the markets
- The planning of the power system
- The design, delivery, funding and evaluation of conservation programs and demand response

- The procurement of generation resources and the ongoing management of these contracts
- Other matters relating to IESO's mandate and matters of concern to stakeholders
- Matters concerning reliability standards, such as those set out by the Northeast Power Coordinating Council (NPCC) or the North American Electric Reliability Corporation (NERC), as they continue to be developed in their established processes.

IESO Stakeholder Advisory Committee Members

Five Constituencies	**Committee Member**
Generators of electricity	- David Butters, APPrO - Jared Donald, Conergy Canada - Valerie Helbronner, Torys - James Scongack, Bruce Power
Consumers of electricity	- Julie Girvan, Consumers Council of Canada - Mark Schembri, Loblaw - Adam White, AMPCO
Distributors and transmitters	- Brian Bentz, Powerstream (Chair) - Rob Mace, Thunder Bay Hydro - Todd Wilcox, North Bay Hydro - Darlene Bradley, Hydro One (transmitter)
Related businesses/services	- Steve Baker, Union Gas - Jack Burkom, Brookfield Energy Marketing - Paul Shervill, Rodan Energy
Ontario communities	- John Beaucage, Counsel Public Affairs - Geoff Lupton, City of Hamilton - Ersilia Serafini, Summerhill
IESO Member	- Terry Young

Financial Overview

The IESO's financial strategy supports the organization's commitment to delivering public value through the integrated management of Ontario's electricity system.

A key priority for the IESO is to effectively manage its costs, which are passed on to Ontario ratepayers. The merger of the IESO and the OPA has produced long-term savings resulting from a workforce reduction of 35 employees, including five fewer senior executives, and the move to a single Board of Directors. These savings are partially offset by one-time costs to be recovered over the immediate and near future, such as combining and rationalizing the underlying IT infrastructure and business processes and systems (e.g., procurement, payroll and financial systems).

Moving into the 2016 plan, the IESO will have absorbed workforce reductions totalling 60 positions over the prior two years.

In 2015, the IESO is managing its ongoing day-to-day responsibilities within a budget of $184.6 million and anticipates a rebate to ratepayers due to higher than expected export volumes. In 2016, the IESO's proposed revenue requirement will continue to reflect $5.3 million in synergies, with additional reductions in staffing and other spending, while also supporting key projects aimed to drive future efficiencies.

Over the 2016-2018 planning cycle, the IESO will maintain its focus on core operations, including planning, conservation, contract management, procurement, and market and systems operations. In 2016, the IESO will also undertake key projects to drive further efficiencies and realize value in future years. These projects include:

- Completing the transition to the Conservation First Framework
- Investing in the Operations business unit framework
- Implementing the demand response and other market-related procurements and reforms
- Establishing an enhanced, consolidated IESO website

While maintaining current operations and undertaking key projects as noted above, the IESO plans to reduce its costs through reductions in staff and other spending – achieving a nine percent lower usage fee of $1.13/MWh in 2016 – as compared to the 2015 combined usage fee of $1.24/MWh. This includes absorbing the higher costs associated with both the recent Society of Energy Professionals arbitration award and the settlement with the Power Workers Union.

In 2017 and 2018, the IESO is planning to deliver further reductions in operating expenditures and resources as a result of various projects initiated in 2016. Operating expenditures compared to 2016 are decreased by two percent by the end of the planning cycle.

The following table outlines the operating revenues and costs over the business planning cycle.

Pro Forma Statement of Operations
For the Year Ended December 31
(in Millions of Canadian Dollars)

Budget ($ Millions)	**2015**	**2016**	**2017**	**2018**
Revenues*	**185.1**	**182.1**	**181.8**	**180.2**
Costs				
Operating Costs	164.5	163.9	163.8	162.3
Amortization	18.7	17.5	17.3	17.2
Interest	1.4	0.7	0.7	0.7
Total Costs	**184.6**	**182.1**	**181.8**	**180.2**

* Originally budgeted revenue figures for 2015. Actuals will be updated to reflect higher than budgeted 2015 export volumes.

A further breakdown by expenditure category is provided in the table below.

2016 Financial Review

Budget ($ Millions)	**2015**	**2016**	**2017**	**2018**
Core Operating Expenses				
Compensation & Benefits	108.9	110.3	109.6	108.1
Professional & Consulting Fees	22.1	20.1	20.1	20.1
Operating & Administration	33.5	33.5	34.1	34.1
Amortization	18.7	17.5	17.3	17.2
Interest	1.4	0.7	0.7	0.7
Total Expenses	**184.6**	**182.1**	**181.8**	**180.2**

A modest decrease of 3.4 percent in 2016 capital spending is projected compared to the 2015 budget. This is primarily due to projects with higher capital spending reaching completion in 2015 as compared to new capital projects planned in 2016. A summary of capital spending and associated project descriptions is included in Appendix 3.

Planned Projects ($ Millions)	2015	2016	2017	2018
Total Capital Projects	29.4	28.4	23.4	22.2

The IESO regularly reviews the priorities amongst its proposed capital initiatives. Therefore, the business planning process establishes approval of an appropriate capital envelope for the 2016-2018 planning period, with capital commitments approved individually on an ongoing basis. This practice is consistent with prior years.

Staffing

Budgeted staffing levels in 2016 decline compared to 2015, maintaining the merger synergies with additional reductions to absorb the impacts of the Society of Energy Professionals arbitration award, the settlement with the Power Workers Union.

Further declines are planned for in 2017 and 2018 as a result of business enhancement efficiencies initiated in 2016. In total, a two-percent reduction in the staffing budget is anticipated to occur over the planning period.

Staffing Budget	2015	2016	2017	2018
Core FTE	694	688	684	680
Smart Metering, Enforcement & Education	36	36	36	36
Total FTEs	**730**	**724**	**720**	**716**

Fee Proposal

As a result of the merger, the IESO is currently collecting two fees (IESO $0.803/MWh; OPA $0.438/MWh), which are charged to different customer bases. The predecessor IESO fee is charged to a combination of energy withdrawals, embedded generation and exports, while the OPA fee is based solely on energy withdrawals. For 2016 and future years, the IESO is proposing to charge one fee on the same basis that the predecessor IESO fee is currently charged. The IESO gained approval to charge its fee to embedded generation in 2014 as it is a

fairer method of allocation and is consistent with the original intent that the IESO fee should be charged to all Ontario load, rather than just a portion. The same basis applies to the proposed 2016 IESO fee. In considering this matter, an independent consultant was hired to examine the existing OPA and IESO usage fees and to examine options for recovering the revenue requirement of the IESO in 2016 and beyond. The consultant's conclusions support charging a single fee to all customers, recognizing energy withdrawals, embedded generation and exports. The support for charging the fee to exports is based on the consultant's cost allocation and rate design study, while support for charging the fee to embedded generation is based on the same rationale accepted previously in obtaining approval to charge the fee to embedded generation.

Appendix 1: Corporate Performance Measures (CPMs)

The IESO has an established performance management program. Central to this program are effective corporate performance measures (CPMs) that assess the organization's performance against established corporate strategic themes and objectives.

CPMs for 2016 were developed collaboratively with the input of each business unit and key subject matter experts to effectively gauge progress on the IESO's strategic themes of Providing Public Value, Building Corporate Resilience, and Respecting and Valuing Our Stakeholders, as well as the six underlying strategic objectives identified for the IESO. The proposed targets are intended to be results-oriented, externally focused, measureable, specific and achievable.

The IESO identified eight targets focused on reliability, market effectiveness, operational capabilities, reputation and relationships. The targets have been shared with stakeholders and intervenors, and the IESO has incorporated any relevant feedback.

#	**Corporate Performance Measure**
1	The IESO is 100% compliant with NERC high violation risk factor requirements that are within the IESO's control
2	Conservation portfolio is delivered within 4¢/kWh while achieving energy savings from LDCs (800 GWh) and from direct-connect customer programs (524 GWh)
3	Up to 900 MW of renewable supply resources are procured in 2016, as directed
4	A Demand Response (DR) auction is implemented that maintains DR capacity at current levels and at competitive market prices while facilitating larger numbers and types of participation
5	Key recommendations arising from provincial and regional plans are initiated and progressing according to their timelines
6	Stakeholders and local communities are surveyed and are satisfied with the engagement process in 2016 (baseline results established later in 2015)
7	Priority projects are completed on time and budget and meet their business objectives
8	Deliverables are executed within approved budget and headcount while meeting synergy targets and a reduced combined fee

Appendix 2: Key 2015 Risks

The IESO has developed a robust risk framework to identify and mitigate risks to the business. To support the framework, a corporate risk team – with representation from all business units – is in place. Risk reporting is provided to the Audit Committee of IESO's Board of Directors on a quarterly basis.

The IESO assessed the risks to the business and has identified key risks in the areas of corporate resiliency, people, and stakeholder engagement and management. Corporate resiliency risk ensures the protection of the organization's assets from cyber security threats, ensures the IESO continues to adapt its current business operating model and efficiently integrates new entrants and technologies to keep pace with the breadth and pace of change of Ontario's evolving energy environment to continue to maintain grid reliability. People risk focuses on ensuring that the pace of organizational integration does not lead to the ineffective execution of the IESO's strategy. Lastly, stakeholder engagement risk ensures the support of government, stakeholders, customers and Aboriginal communities through effective consultation and engagement, allowing the IESO to effectively pursue its key initiatives. Mitigation plans have been defined and are in place for each of the risks, and a process has been put in place to monitor and report on the progress of these plans.

#	**Risk**
1	Insufficient support from key stakeholders and Aboriginal communities impacts the IESO's ability to effectively pursue key initiatives
2	The breadth and pace of change of Ontario's evolving energy environment challenges the IESO's ability to maintain grid reliability and efficiently integrate new entrants and technologies into the operation of the grid
3	Slow rate of progress in workforce integration leads to ineffective execution of the IESO's strategy
4	A significant IESO cyber security event occurs

Appendix 3: IESO Capital Projects

Summary of 2016 – 2018 Capital Spending

Projects ($ Millions)	2015 Budget	2016 Plan	2017 Plan	2018 Plan
Revenue Metering System Upgrade	2.1			
Energy Management System (EMS) Refresh	2.7	4.7		
Market Information Management (MIM) Refresh	1.8	0.4		
Registration Automation	0.7	0.3		
Outage Management replacement and redesign	0.8	0.8		
NERC Critical Infrastructure Protection projects	2.5	1.0		
Market Information System (MIS) Refresh	2.2	2.5	1.7	
HRIS Implementation	1.1			
Demand Response Auction	1.0	2.5		
Infrastructure refresh (building services, software licenses & computer hardware)	1.8	2.6	3.2	2.7
Enterprise Cyber Security Management Refresh		0.5	1.0	
Enterprise Cybersecurity Enhancement		1.0		
Operations Readiness Initiative		1.0	2.5	2.5
MACD Enforcement Support Tool			1.0	
Operating Security Limit Technical Refresh			2.0	
Settlements Replacement			1.0	2.0
Dispatch Data Management			2.0	
Capacity Auction			1.0	2.0
Oracle Archetype Expansion and Oracle batch			1.0	0.4
Load Balancers Refresh				0.8
FIT, microFIT and CRM platform upgrades				0.7
Total Capital Projects ($1M & above)	**16.7**	**17.3**	**16.4**	**11.1**
Other Capital Projects	12.7	11.1	7.0	11.1
Total Capital Projects	**29.4**	**28.4**	**23.4**	**22.2**

Capital Project Descriptions

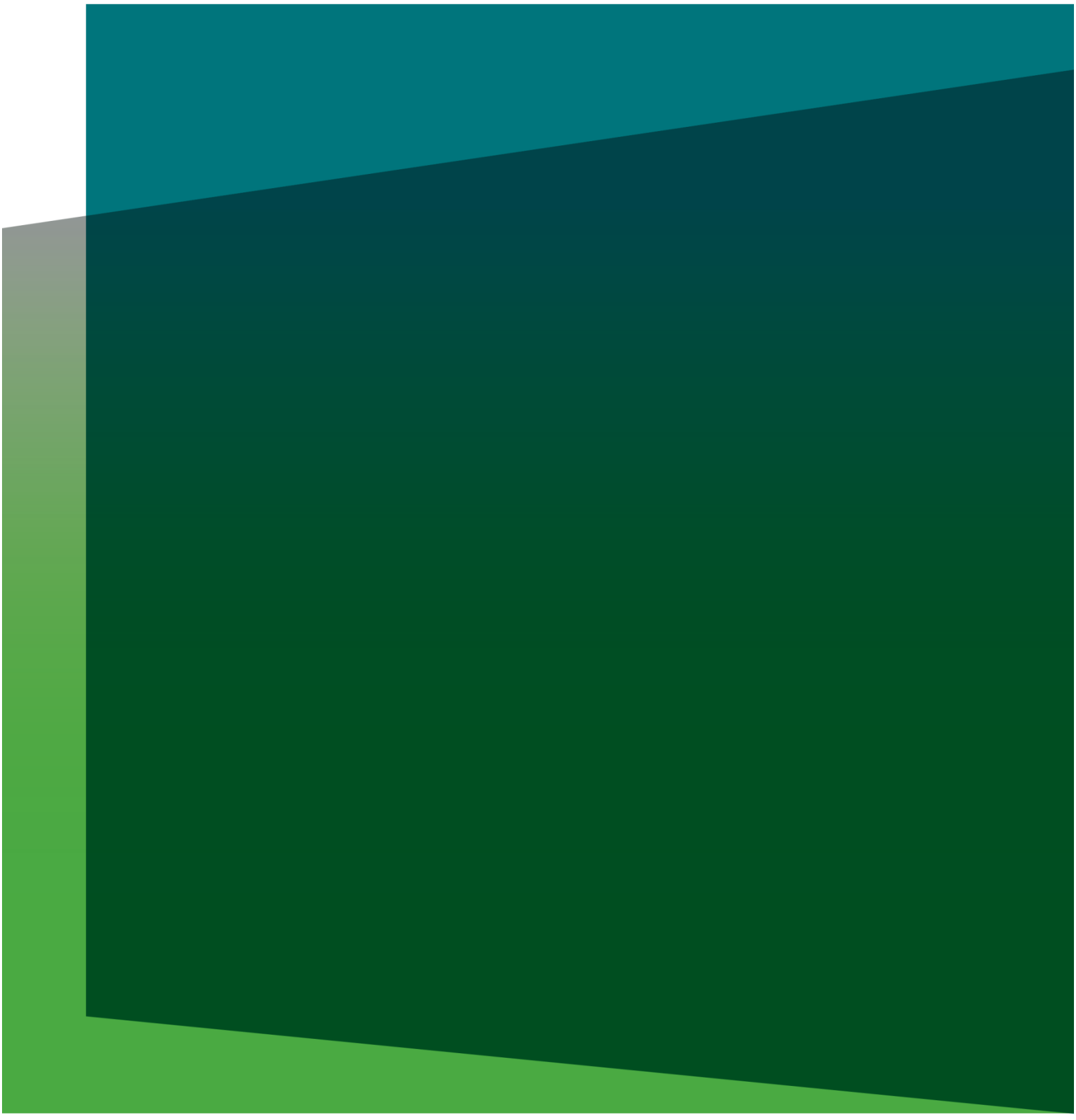
2016 - 2018 Capital Plan Details

Projects	Description
Energy Management System (EMS) Refresh	The EMS upgrade project involves the migration to the most recent ABB EMS product available and the replacement of the existing production and testing hardware across all primary and backup environments. The primary goal of the project is to transition daily power system operations to a robust and modern EMS platform that is expected to last until 2020. This project will be completed in 2016.
Market Information Management (MIM) Refresh	The MIM system provides interfaces for Market Participants to submit their dispatch data, stores market results ands makes the data available for downstream processing in the day-ahead, real-time and settlement timeframes. The MIM System has reached its end of life cycle; the technology has not been upgraded since market opening and the ability to maintain required service levels is becoming more challenging.
Registration Automation	The Registration Automation will replace the IESO paper forms based solution for registering participants with an electronic forms solution. Market Participant registration can be broken down into four individual activities or components: enrolment in the various IESO programs; granting and revoking of various access privileges; registration of meters; and registration of facilities. The final components of this program will be completed in 2016. This project includes a complete review of the registration processes and the introduction of a Business Process Management solution to implement the new registration processes.
Outage Management replacement and redesign	The primary focus of this project is to replace our current Integrated Outage Management System (IOMS) – a system that is used by a high volume of Operations staff each day to facilitate the submission, assessment and approval of nearly 20,000 outage requests from over two hundred market participants per year. IOMS is responsible for integrating all market participant outage requests into the IESO-administered market (IAM) which makes it critical to the reliable operation of the IESO-controlled grid (ICG).
NERC Critical Infrastructure Protection projects	Effective April 1, 2016 NERC has introduced new standards with respect to the protection of critical cyber assets (NERC CIP v5). The IESO has established a multi-faceted program including physical, architectural and process improvements to support compliance with these new standards.
Market Information System (MIS) Refresh	The MIS, which calculates the Market Clearing Price for settlement purposes, is used by the IESO to meet its primary obligations to determine dispatch schedules in both real-time and pre-dispatch timeframes, while satisfying operating reserve requirements and respecting transmission and security limits. This project which will last throughout the majority of the business planning timeframe, will update both the application and the underlying supporting infrastructure.
Demand Response Auction	A competitive, priced-based demand response auction, open to load participants, will be designed and developed during 2015 to secure resources. In addition, demand response pilots will be launched this year to test the capability of demand resources to follow load in real time and commit ahead of time to reduce their consumption when needed. Developing demand-based resources will add to the diversity of resources participating in the market, driving innovation and increasing flexibility.

Capital Descriptions Continued

2016 - 2018 Capital Plan Details

Projects	Description
Infrastructure refresh (building services, software licenses & computer hardware)	To procure Racks and Enclosures to expand the IESO's blade server rack and enclosure infrastructure which will facilitate the requirements of emerging projects. This project also includes miscellaneous building services and software license renewals.
Enterprise Cyber Security Management Refresh & Enhancements	This project will include enhancements to cybersecurity analytical capabilities, procurement of new technology to address advanced malware and sourcing of additional cybersecurity intelligence. This project also includes a refresh of cybersecurity technologies.
Firewall Upgrades	This project will refresh all existing firewalls to mitigate the risk of cyber related events and ensure security of the IESO's networks.
Operations Readiness Initiative	A holistic review of all the processes and tools in Market and System Operations with the intent to sustain the necessary services to meet reliability standards with the efficient use of resources.
MACD Enforcement Support Tool	Implement an enhanced, IT-supported information solution to help MACD effectively and reliably conduct its enforcement activities in Ontario.
Operating Security Limit Technical Refresh	This project is related to the Market Information System Refresh and the management of limits would influences the outcomes of this project. This project includes some changes to the library needs as well improvements in limit activations.
Settlements Replacement	The existing settlements system is an internally developed calculation engine of charge types to settle the electricity market. The IESO plans to review and replace this system with a standard software application generally used in the North American market place.
Dispatch Data Management	This project will refresh of the Dispatch Data Management System to sustain the level of services to meet reliability standards.
Capacity Auction	A competitive priced-based capacity auction, leveraging on the completed DR auction to procure capacity for multiyear commitments. This project is intended to secure resources to meet incremental capacity needs in future years.
Oracle Archetype Expansion and Oracle batch	The Oracle Exadata appliance is the IESO's enterprise Oracle database server. This project will add both disk and CPU capacity to support additional applications and further database growth of existing applications.
Load Balancers Refresh	This project will refresh all the load balancers in the IESO networks to ensure efficient network operations.
FIT, microFIT and CRM platform upgrades	A replacement/replatforming of the existing FIT and microFIT system based on program requirements and business needs and an upgrade the existing CRM platform to the latest version of the Microsoft Dynamics CRM platform.



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